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EXAMINER	
CANTELMO, GREGG	

ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 05/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/700,988	YATA ET AL.	
	Examiner	Art Unit	
	Gregg Cantelmo	1745	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 February 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10,27-29 and 31-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *32-35* is/are allowed.

6)☒ Claim(s) *1,2,5,7,9,10,27-29 and 31* is/are rejected.

7)☒ Claim(s) *3,4,6 and 8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *February 26, 2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. In response to the amendment received February 26, 2004:

a. Claims 1-10, 27-29 and 31-35 are pending. Claims 11-26 and 30 have been cancelled as per Applicant's request;

b. The prior art rejections stand as modified in light of the amendment. For the record, claims 1, 2, 5, 7, 9, 10, 27-29 and 31 are rejected. Claims 3, 4, 6 and 8 are objected to for the reasons set forth herein as being duplicate claims of claims 32-35 (claims 32-35 being allowed).

c. Copending U.S. Application Serial No. 10/637,450 is related to the instant application but is drawn to the non-elected inventions of claims 11-26 and 30. Since the latter application was filed in response to the restriction requirement presented in the instant application, no double patenting rejection is currently applied.

Information Disclosure Statement

2. The information disclosure statement filed February 26, 2004 has been placed in the application file and the information referred to therein has been considered as to the merits.

Claim Objections

3. Claims 3, 4, 6 and 8 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 32-35. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 2, 9 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bates in view of Linden "Handbook of Batteries" (hereafter referred to as Linden.

Bates discloses a non-aqueous secondary battery comprising positive and negative electrodes (col. 5, ll. 13-17 and 34-37) and a lithium salt-containing electrolyte (col. 6, ll. 32-38) the battery has an volumetric energy density of 670 Wh/L (col. 5, ll. 33-37) for a battery volume of 60 L (col. 5, ll. 33), thus the energy capacity for the cell is over 30 Wh. Each cell 84 includes a 10 micron thick cathode, 9 micron thick anode and 1 micron thick electrolyte (col. 5, ll. 12-17) for a total cell thickness of 20 microns. The battery stack has 54 of these cells (col. 5, ll. 31-33) giving rise to a total thickness of 1080 microns or 1.08 mm (as applied to claim 1).

The positive electrode contains manganese oxide (col. 5, ll. 8-10 and 60-68 as applied to claim 2).

The battery is of a rectangular shape (Fig. 10 as applied to claim 9).

The differences between claims 1 and 31 and Bates are that Bates does not disclose the negative electrode (anode) being a material capable of being doped and undoped with lithium (claim 1) and further of the negative electrode material selected from the group of claim 31.

The anode material of Bates is a lithium foil.

Linden discloses replacing lithium metal anodes with carbon materials (page 36.5, section "Carbon Materials"). Carbon materials reversibly accept and donate lithium. The carbon materials include graphite. Furthermore the negative electrode can be a metal oxide (page 36.9 of Linden).

The motivation for using carbon as the negative electrode material instead of lithium is that it provides an electrode material which reversibly accepts and donates lithium without affecting the mechanical and electrical properties of the cell (Linden page 36.5). Additionally removing lithium from the battery for another negative electrode material is known to improve the safety of the battery (Linden, page 36.24).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Bates by replacing the lithium metal negative electrode material with a carbon material since it would have provided an electrode material which reversibly accepts and donates lithium without affecting the mechanical and electrical properties of the cell. The selection of a known

material based on its suitability for its intended use supported a prima facie obviousness determination in Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945) See also In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

Response to Arguments

6. Applicant's arguments with respect to claims 1, 2, 9 and 31 have been considered but are moot in view of the new ground(s) of rejection.

It is held that the amendment to claim 1, which further defines the negative electrode material is an obvious modification to Bates, in light of the teachings of Linder.

As such, claims 1, 2, 9 and 31 are held to be obvious over the rejection above.

Claim Rejections - 35 USC § 103

7. Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bates, in view of Linden as applied to claims 1 and 2 above, and further in view of EP 0808798-A2 (EP '798).

The teachings of claims 1 and 2 have been discussed above and are incorporated herein.

The differences not yet discussed are of using double-structure graphite having graphite based-particles and amorphous carbon layers covering the particles, the graphite particles having (d002) spacing of (002) planes of not more than 0.34 nm and

the carbon layers having (d002) spacing of (002) planes of 0.34 nm or higher (claim 5) or of the active material comprising a graphite carbon material (claim 7).

With respect to the graphite material (claims 5 and 7):

EP '798 teaches of using double structure graphite particles in a negative electrode wherein the graphite particles having (d002) spacing of (002) planes of not more than 0.34 nm and the carbon layers having (d002) spacing of (002) planes of 0.34 nm or higher. The particles having an average particle diameter of 1-50 microns as active material (abstract, page 4, ll. 1-24).

The motivation for using the graphite particles as taught by EP '798 is that it inhibits the decomposition of the electrolytic solution, increases the discharge capacity of the cell and improves cycling characteristics.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Bates by using the graphite particles as taught by EP '798 since it would have inhibited the decomposition of the electrolytic solution, increased the discharge capacity of the cell and improved cycling characteristics.

With respect to the product-by-process limitations of claim 7:

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-

process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

"The Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). See MPEP section 2113.

In the instant case, EP '798 teaches of providing mesocarbon particles to the negative electrode. The process conditions recited in claim 7 bear no weight to the patentability of the claimed invention, a battery. Further the term volatile components is not clearly understood as a positive component of the final product since the baking process appears to remove the volatile components from the graphite (see pages 40-45). Since the end product of the combination of the prior art obviates providing a mesocarbon graphite material to the anode, the prior art is held to render claim 7 as obvious.

8. Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bates, in view of Linden as applied to claims 1 and 2 above, and further in view of JP 06-295744 A (JP '744).

The teachings of claims 1 and 2 have been discussed above and are incorporated herein.

The differences not yet discussed are of using double-structure graphite having graphite based-particles and amorphous carbon layers covering the particles, the graphite particles having (d002) spacing of (002) planes of not more than 0.34 nm and the carbon layers having (d002) spacing of (002) planes of 0.34 nm or higher (claim 5) or of the active material comprising a graphite carbon material (claim 7).

With respect to the graphite material (claims 5 and 7):

JP '744 teaches of using double structure graphite particles in a negative electrode wherein the graphite particles having (d002) spacing of (002) planes of not more than 0.34 nm and the carbon layers having (d002) spacing of (002) planes of 0.34 nm or higher. The particles having an average particle diameter of 1-50 mm as active material (abstract and claims).

The motivation for using the graphite particles as taught by JP '744 is that it inhibits the decomposition of the electrolytic solution, increases the discharge capacity of the cell and improve cycling characteristics.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Bates by using the graphite

particles as taught by JP '744 since it would have inhibited the decomposition of the electrolytic solution, increased the discharge capacity of the cell and improved cycling characteristics.

With respect to the product-by-process limitations of claim 7:

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

"The Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). See MPEP section 2113.

In the instant case, JP '744 teaches of providing mesocarbon particles to the negative electrode. The process conditions recited in claim 7 bear no weight to the patentability of the claimed invention, a battery. Further the term volatile components is not clearly understood as a positive component of the final product since the baking process appears to remove the volatile components from the graphite (see pages 40-45). Since the end product of the combination of the prior art obviates providing a mesocarbon graphite material to the anode, the prior art is held to render claim 7 as obvious.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bates, in view of Linden as applied to claims 1 and 2 above, and further in view of U.S. patent No. 6, 040,078 (Fauteux).

The teachings of claims 1 and 2 have been discussed above and are incorporated herein.

The difference between instant claim 6 and Bates is that Bates does not disclose the thickness of the battery case.

Fauteux discloses of a battery casing having a thickness between 0.3 and 0.4 mm (col. 3, ll. 61-67).

The motivation for providing a battery casing of this thickness is to provide a relatively lightweight battery.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Bates by providing a battery

casing having a thickness between 0.3 and 0.4 mm since it would have provided a relatively lightweight battery.

Response to Arguments

10. Applicant's arguments with respect to claims 5, 7 and 10 have been considered but are moot in view of the new ground(s) of rejection.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., arguments to the heat dissipation of the battery (see page 7 of Applicant's arguments in the amendment received February 26, 2004) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Claim Rejections - 35 USC § 103

11. Claims 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bates in view of Linden and JP 09-028042-A (JP '042).

The teachings of claims 1 and 2 have been discussed above and are incorporated herein.

The differences between instant claims 27-29 and Bates are that Bates does not disclose measuring operation parameters of the battery and controlling the parameters based on the results of the measurements.

JP '042 discloses measuring the current tension at the ends of the battery 1a and controlling the operation of the battery based on the results of the measurement (abstract and Figs. 3 and 7 as applied to claims 27-28).

Overcharging is known to result in an increase in the internal pressure and temperature of the battery. Therefore in preventing overcharging by monitoring the current tension in the battery and controlling the operation of the battery based on the results, JP '042 also regulates the internal pressure in the cell and thermal properties of the cell (as applied to claim 29).

The motivation for monitoring and controlling these cell parameters is that it prevents cells from exploding and prevents overcharging of the battery (abstract).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Bates by monitoring and controlling parameters such as internal pressure and current since it would have prevented overcharging of the battery.

Response to Arguments

12. Applicant's arguments with respect to claims 27-29 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

13. Claims 32-35 are allowed. See page 9 of the amendment received February 26, 2004 and items 19-21 of the previous office action, all incorporated herein.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Koehler et al. "High Performance Nickel-Metal Hydride and Lithium-Ion Batteries" discloses a non-aqueous battery comprising a positive electrode, a negative electrode made of an intercalating material such as carbon, and a lithium-salt containing electrolyte (page 96, section 3 and abstract). The energy density and energy capacity of the lithium batteries are in excess of the lower limits of claim 1 (abstract). Chapter 3 of Linden is provided to show that the dimensions of the cell can be varied to provide for particular cell characteristics and performance. U.S. patent No. 6,664,006 is to small size lithium batteries having high specific energy and capacity (abstract). U.S. patent No. 6,087,036 discloses thermal management in flat lithium batteries (see col. 6, ll. 52-65 and col. 2, ll. 10-36).

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (571) 272-1283. The examiner can normally be reached on Monday to Thursday from 9 a.m. to 6 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. FAXES received after 4 p.m. will not be processed until the following business day. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gregg Cantelmo
Primary Examiner
Art Unit 1745

gc

May 6, 2004